

Focus. . . Injuries in Missouri: 1994 Deaths, Hospitalizations and Outpatient Treatments

Injuries are a serious public health problem. During 1994, injury caused the deaths of 3,791 persons in Missouri. That same year, considering all hospitalizations, emergency department visits, outpatient surgery, and observations combined, more than 1 out of 10 Missourians were treated for nonfatal injury, with 46,323 cases severe enough to be hospitalized. There is an unknown number of other, usually less serious, injuries treated in physician offices, first aid centers, or at home, etc. (See Chart 1).

Prior to 1993, cause-of-death codes on death certificate data were the only reliable source of information available regarding the incidence of injury in Missouri. Considering the large numbers of hospitalizations and especially emergency department visits for injury, fatal injuries were only the "tip of the iceberg", as Chart 1 shows. While in years prior to 1993 hospital discharge records had been collected for inpatients treated in Missouri, external cause of injury (E-code) data were not required and were infrequently reported. Before 1993, no more than 40 percent of hospital discharge records of persons treated for injury contained an E-code. Until 1993, complete information was not systematically collected statewide from emergency departments or outpatient surgery clinics. The Patient Abstract System (PAS) was implemented by the Missouri Department of Health at the beginning of 1993. The PAS is a mandatory reporting system, gathering data from almost every hospital and ambulatory surgery facility in Missouri. Data from medical records of all persons hospitalized as inpatients or treated as outpatients (emergency department, outpatient surgery, observation, and diagnostic imaging) are reported. PAS records of every patient diagnosed as injured are required to state the external cause of injury as an E-code from the ICD-9-CM diagnostic manual.¹ In 1994, more than 9 out of 10 patient records with injury contained a valid E-code. Records of death from injury always state the external cause of injury code.

Information from both death records and PAS are reported in Table 1. Cause of injury categories are equivalent to those used in the National Center for Health Statistics, "Interim Matrix Table for E-coded Injury Mortality Data, March 7, 1996." Categories for motor vehicle nontraffic, unarmed fight or brawl, and rape were added since these occur frequently among nonfatal injuries and/or are of concern.

Unintentional, suicidal and assaultive injuries are all three among the top ten leading causes of death in Missouri and nationwide. About 6.8 percent of all deaths in Missouri during 1994 resulted from injury. Among those injury-related deaths, 61 percent were classified as accidental or unintentional, while almost one in five was self-inflicted and one in six was assault related. Motor vehicle traffic crashes were responsible for 31.2 percent of all injury fatalities, and caused 51.0 percent of unintentional deaths by injury in Missouri during 1994. Gunshot (unintentional, suicide, and homicide) was the second leading cause of death by injury, accounting for 26.6 percent of injury fatalities recorded in the state that year. Injury is the single most frequent cause of premature death. In 1994, of all deaths of Missouri residents under the age of 35, fully 51.7 percent died of injury.²

Serious nonfatal injuries, those requiring hospitalization, are most often the result of falls. During 1994, falls accounted for 43.2 percent of all inpatient episodes caused by injury. The second leading cause of serious nonfatal injury, at 16.7 percent, was motor vehicle crashes. Poisonings by foodstuffs, chemicals, gases or medications were responsible for 10.3 percent of injury related hospitalizations. Over 85 percent of injury-related hospitalizations were unintentional. Self-inflicted injuries requiring hospitalization outnumbered assaults (7.1 percent vs. 5.5 percent, respectively).

In the Patient Abstract System, 94 percent of outpatient records of treatment for injury originate in emergency departments. Outpatient surgery accounts for 3 percent, observation for 2 percent, and 1 percent of outpatient visits are for diagnostic imaging (CAT scans, MRIs, etc.).

As shown in Table 1, almost one-fourth (23.5 percent) of injured patients treated and released on an outpatient basis had suffered falls. Other common reasons for outpatient treatment of injury are cuts, traffic crashes, and being struck by an object. The "Other" category of outpatient injury treatment includes overexertion, animal and insect bites, scalds, caught between objects, and pedal cycle incidents. Nearly 95 percent of outpatient injury encounters were unintentional, while assaults were second with 4.2 percent.

Population-based rates of injury-related deaths and medical treatments are displayed in Chart 2. The vertical scale is logarithmic. The rate of death by injury for males is always greater than the rate for females. All three rates of injury- death, hospitalization and outpatient care-decline somewhat between the ages of 5 and 14, then rise during the teenage years for both males and females. From early adulthood to retirement age at 65, injury rates for men reduce slowly, but are always higher than the rates for women during these years in the work force. Increases in injury rates are found for both men and women after age 65. In the 65-74 age group, injury rates increase more dramatically among women than among men, primarily due to falls. Within the elderly population, aged 65 and over, rates of nonfatal injuries among women overtake and remain higher than the rates for men.

Injuries are costly. Direct medical care, rehabilitation expenses, long-term disability, losses in productivity and earnings, and survivor benefits are all significant costs of injury.³ Programs that work to reduce the risk of injury are not only cost-effective, but also serve to safeguard and enhance the quality of life for all Missourians.

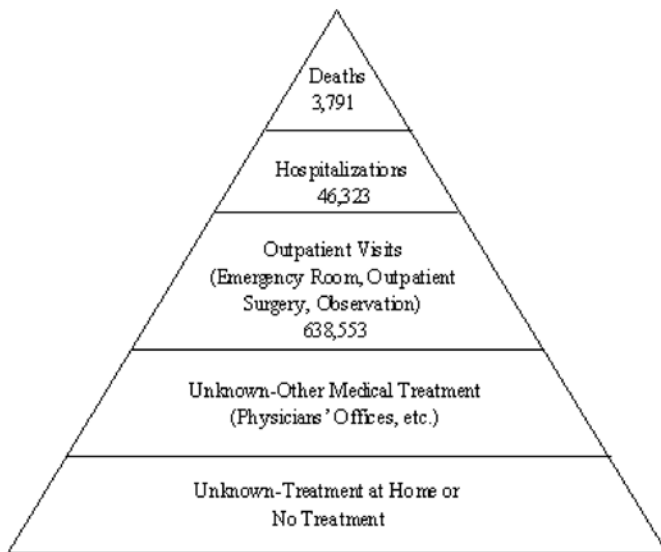
The advent of the Patient Abstract System allows a more complete picture of the incidence of injury in Missouri. Reasonably accurate measurements of nonfatal, yet serious, injuries are now possible. Quantitative studies assessing the magnitude and scope of injury in Missouri are important. Information from the Patient Abstract System is of great value, for example, in both developing and evaluating prevention strategies, safety education and awareness programs, highway safety interventions, and efforts to reduce workplace injury.

References:

1 Craig D. Puckett. The Educational Annotation of ICD-9-CM. Reno, NV: Channel Publishing Co., 1995.

2 Missouri Dept. of Health, Missouri Vital Statistics. Jefferson City, MO: State Center for Health Statistics, 1994.

Chart 1
Recorded Injury Deaths and Records of Treatment for Injury: Missouri 1994



3 Dorothy P. Rice, Ellen J. MacKenzie, and Associates. Cost of Injury in the United States: A Report to Congress. San Francisco, CA: Institute for Health & Aging, University of California and Injury Prevention Center, The Johns Hopkins University, 1989.

Chart 2
Recorded Rates per 1,000 Population by Gender by Age of Injury
Deaths and Records of Treatment for Injury: Missouri 1994

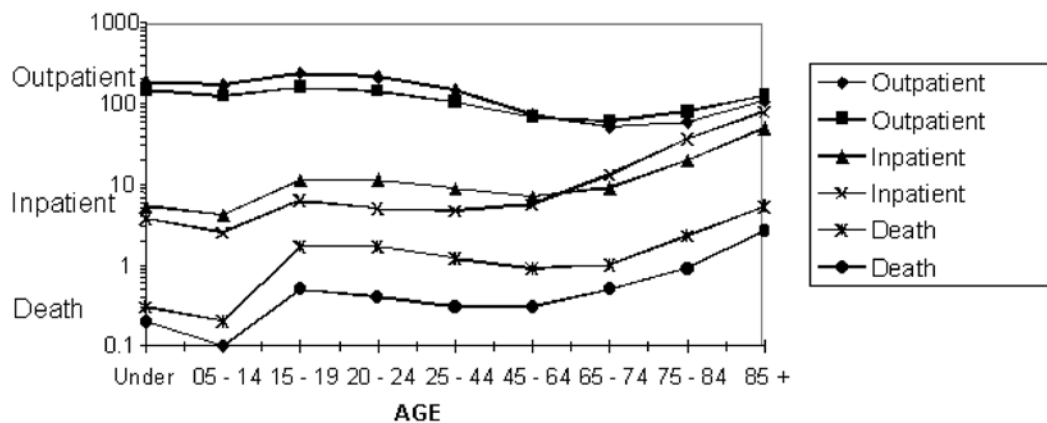


Table 1

Recorded Injury Deaths, Hospitalizations, and Outpatient Visits by Cause in Intent of Injury: Missouri 1994

	Unintentional	Self Inflicted	Assault	Totals*	Percent
Deaths					
Cut / Pierce	3	10	74	89	2.4
Drown / Submersion	76	2	0	81	2.1
Falls	381	5	0	387	10.2
Fire / Flames	98	1	4	105	2.8
Firearms	35	519	433	1,007	26.6
Motor Vehicle, Traffic	1,183	0	0	1,183	31.2

Motor Vehicle, Non Traffic	17	2	0	19	0.5
Unarmed Fight or Brawl	0	0	1	1	0.0
Rape	0	0	0	0	0.0
Poisoning	138	120	2	296	7.8
Struck By or Against Object	30		18	48	1.3
Suffocation	86	89	24	207	5.5
Medical Care Related	35	0	0	35	0.9
Other	237	3	72	333	8.8
TOTAL DEATH	2,319	751	628	3,791	100.0
Percent	61.2	19.8	16.6	100.0	
Hospitalizations					
Cut / Pierce	623	78	388	1,099	2.5
Drown / Submersion	80	2	0	82	0.2
Falls	19,125	16	4	19,167	43.2
Fire / Flames	405	9	5	423	1.0
Firearms	360	100	734	1,462	3.3
Motor Vehicle, Traffic	7,397	0	0	7,397	16.7
Motor Vehicle, Non Traffic	604	4	0	609	1.4
Unarmed Fight or Brawl	0	0	548	548	1.2
Rape	0	0	6	6	0.0
Poisoning	1,378	2,901	5	4,557	10.3
Struck By or Against Object	1,121	0	321	1,442	3.3
Suffocation	114	15	3	134	0.3
Medical Care Related	1,024	0	0	1,024	2.3
Other	5,909	21	426	6,453	14.5
Cause of Injury Unknown				1,920	4.1
TOTAL INPATIENT	38,140	3,146	2,440	46,323	100.0
Percent	85.9	7.1	5.5	100.0	
Outpatient Visits					
Cut / Pierce	64,142	510	1,765	66,532	11.4
Drown / Submersion	285	2	3	293	0.1
Falls	137,210	12	27	137,358	23.5
Fire / Flames	3,821	9	23	3,869	0.7
Firearms	918	69	764	2,062	0.4
Motor Vehicle, Traffic	67,881	0	0	67,881	11.6
Motor Vehicle, Non Traffic	4,291	1	0	4,294	0.7

Unarmed Fight or Brawl	0	0	13,540	13,540	2.3
Rape	0	0	336	336	0.1
Poisoning	8,504	2,439	59	11,806	2.0
Struck By or Against Object	86,579	0	2,558	89,137	15.2
Suffocation	1,319	44	41	1,412	0.2
Medical Care Related	3,977	0	0	3,977	0.7
Other	175,288	231	5,329	182,025	31.1
Cause of Injury Unknown				54,031	8.5
TOTAL OUTPATIENT	554,215	3,317	24,445	638,553	100.0
Percent	94.8	0.6	4.2	100.0	
* Includes cases where intent could not be determined					

Provisional Vital Statistics for March 1996

Live births decreased in March as 5,902 Missouri babies were born compared with 6,113 in March 1995. The monthly birth rate dropped from 14.0 to 13.0 per 1,000 population.

Cumulative births for the 3- and 12-month periods ending with March also decreased. For the first quarter of 1996, 18,708 births occurred compared with 18,986 for the first quarter of 1995.

Deaths show increases for all three time periods shown below primarily because of a flu epidemic earlier this year.

The **Natural increase** in March was 733 (5,902 births minus 5,169 deaths) compared with 1,190 one year earlier. For the first quarter of 1996, the natural increase declined by more than 1,000 persons compared with 1995.

Marriages increased in March, but continue to show decreases for the 3- and 12-month periods ending with March.

Dissolutions of marriage decreased for all three time periods show below.

Infant deaths increased in March, but show decreases for the 3- and 12- month periods ending with March. The first quarter infant death rate was 7.3 per 1,000 births compared with 7.8 in 1995.

PROVISIONAL RESIDENT VITAL STATISTICS FOR THE STATE OF MISSOURI

Item	March				Jan.-Mar. cumulative				12 months ending with March				
	Number		Rate*		Number		Rate*		Number		Rate*		
	1995	1996	1995	1996	1995	1996	1995	1996	1995	1996	1994	1995	1996
Live Births	6,113	5,902	14.0	13.0	18,986	18,708	14.4	14.1	74,675	73,297	14.5	14.1	13.8
Deaths	4,923	5,169	11.3	11.4	14,662	15,416	11.1	11.6	52,787	54,623	10.4	10.0	10.2
Natural increase	1,190	733	2.7	1.6	4,324	3,292	3.3	2.5	21,888	18,674	4.1	4.1	3.5
Marriages	1,995	2,544	4.6	5.6	8,631	8,056	6.5	6.1	46,423	44,304	8.4	8.8	8.3
Dissolutions	2,422	2,080	5.6	4.6	7,215	6,785	5.5	5.1	27,133	26,414	5.1	5.1	5.0
Infant deaths	41	53	6.7	9.2	149	140	7.8	7.3	590	544	8.2	7.9	7.4
Population base (in thousands)	...	...	5,323	5,352	...	...	5,323	5,352	...	...	5,245	5,202	5,330

* Rates for live births, deaths, natural increase, marriages and dissolutions are computed on the number per 1000 estimated population. The infant death rate is based on the number of infant deaths per 1000 live births. Rates are adjusted to account for varying lengths of monthly reporting periods.

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